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Mental disorders and mental health care in Canada and Australia: comparative epidemiological findings

■ **Abstract** *Background* Canada and Australia although geographically distant have similarities in human geography and history. Each has had a national mental health policy for some years, but Australia has driven policy implementation in this area harder than has Canada. Comparable epidemiological surveys from Australia in 1997 and Canada in 2002 allow us to explore relative rates of mental disorders and compare estimates of access to care from mental health services. *Methods* We compare findings from the Australian National Survey of Mental Health and Wellbeing (1997) with those from the Canadian Community Health Survey on Mental Health and Well Being, cycle 1.2 (2002). *Results* Differences in prevalence rates and in service utilisation emerge between the two countries: Anxiety Disorders are estimated as almost 2% higher in Canada than in Australia while there is suggestion that Major Depressive Disorder, Alcohol Dependence and Drug Dependence may be more prevalent in Australia. More of the people with co-morbid disorders in Australia than in Canada make use of mental health services and a finding of marginal significance suggests that this may be true across all disorders. *Conclusions* Causation cannot be determined from this study but possible explanations for differences in prevalence include changes in global economic, political and security contexts and concerns between 1997 and 2002 and the possible role of greater availability of alcohol in Australia. The findings also provide encouragement that strenuously implementing a national mental health policy may have been of benefit to people with mental health problems in Australia.

■ **Key words** mental health surveys – mental disorders – international comparisons – service use – mental illness prevalence rates

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Introduction

■ Mental disorders and service use across nations

Large, well-designed epidemiological studies, focussing on access and equity, can provide national prevalence estimates of psychiatric disorders, and associations of interest such as service use, hence benefiting the planning of services as well as advocacy for the needs of people suffering from mental health disorders. Recent information from the Lancet Global Mental Health Group [42] shows that annually 30% of the world's population has some form of mental disorder, and of those people, about two-thirds receive no treatment, even in high-income countries. Similar findings have been echoed in

numerous national and cross-national studies, including the European study of the epidemiology of mental disorders (ESEMeD) project in 2004 [3, 6, 16, 61]. In a study of 17 countries, Wang et al. [67] found that among the ten high income countries in the study, between 40 and 61% of individuals with severe mental disorders had received services during the previous 12-months, compared to 24–40% of individuals with moderately severe mental disorders and 13–27% of people with mildly severe mental disorders. The World Bank considers 60 countries, including Canada and Australia, to have high-income economies, defined as having gross national income (GNI) per capita in 2006 of (U.S.) $11,116 or more [71]. Thus, it can be assumed that the rates of mental health services utilisation for Canada and Australia also fall within the same ranges as found by Wang et al. [67]. The study findings suggest further research in determining if some mental health disorders would have utilised more services than others and if differences exist between countries.

Numerous studies have examined the varied rates of mental disorders found throughout the world. In their comprehensive literature review, De Girolamo and Bassi [22], noted 65 large-scale mental health surveys conducted over 25 years across 33 countries. However, they found that cross-national studies were relatively rare and most research papers documented findings from individual surveys within individual countries. Indeed, the literature shows that some studies have investigated disorder-specific prevalence among defined cultural/economic groups [52], while others have concentrated on disorder-specific prevalence within one or several regions of a country [40, 41, 44, 55]. Yet other researchers have investigated the prevalence in general or of specific mental disorders within an entire country [19, 23, 36, 51, 54, 57, 65]. With the development in 1998 of the World Health Organization (WHO) World Mental Health version of the Composite International Diagnostic Interview (WMH-CIDI), enabling cross-national comparisons, more studies have been documented recently that investigate prevalence and severity of diagnosed mental disorders in two or more countries [24, 60]. This is in accord with the recommendation from the WHO and the Organization for Economic Cooperation and Development (OECD) for more cross-national studies to be conducted comparing health-related issues [32].

Comparing Australia and Canada

Canada and Australia have many geographic, demographic, and economic similarities and differences [12, 62, 71]. With regard to mental health care, both countries have similar ratios of mental health professionals [12, 62] and each country formulated

mental health policy; Canada in 1988 and Australia in 1992. Both policies address advocacy, promotion, prevention, treatment and rehabilitation.

Throughout the mid- and late-1990s, the Australian federal government actively promoted changes in mental health through strategic plans, targeted funding and work with all the States and Territories, guided by the Australian National Mental Health Policy [9, 10, 14, 15, 53]. Mental health care policy implementation in Canada was directly contrasted with that in Australia through the work of a national committee inquiry on mental health in 2006. The committee's work included hearings on the systems in Australia, the United Kingdom, and the United States of America. It was concluded that the impetus behind change in Canada at the federal level had not been as vigorous as in Australia and hence, the Canadian system should adopt similar initiatives in facilitating the delivery of mental health care [39].

Large mental health surveys have been conducted in Canada (the Canadian Community Health Survey on Mental Health and Well Being, cycle 1.2 (CCHS 1.2) [29]) and in Australia (the Australian National Survey of Mental and Well Being (NSMHWB) [5, 68]) using versions of the Composite International Diagnostic Interview (CIDI) [73]. In Australia, a then-current version of the WHO-CIDI was employed as the survey instrument in 1997, whereas in Canada, the CCHS1.2 employed an adapted version of the revised and more comprehensive WMH-CIDI in 2002. The WMH-CIDI included assessment of the same target conditions as the earlier versions but also broader areas of assessment and allowed for expansion of the diagnostic sections to include dimensional information rather than just categorical. It had a modified question flow intended to promote episode recall and reduce opportunities to purposively influence the interview duration with strategies that would also lead to false negatives [38].

Levels of service utilisation for mental health care from the two surveys have already been reported in the literature at 10.1% in Canada [64] and 11.1% in Australia [48] but service utilisation has not been systematically compared between the two surveys. Extending results from the Australian national survey into comparisons with Canada and across a range of diagnostic groups would bring Australia further into the body of international epidemiological comparative work.

Patterns of care and co-morbidity

The importance of primary care as a location for mental health care delivery has long been recognized [26], and epidemiological work has only served to reaffirm its salience. General Practitioners (GPs) are the most commonly consulted health care providers, not only for physical problems but also for emotional

Table 1 Key information describing the CCHS 1.2 and the NSMHWB

	CCHS1.2 (Canadian)	NSMHWB (Australian)
Number of participants	36,816	10,641
Age range of participants	Over 15	Over 18
Year data collected	2002	1997
Response rate (%)	77	78
Primary diagnostic instrumentation	WMH-CIDI (lifetime history)	CIDI 2.1-12 (12-month history)
Intended accuracy	Provincial estimates	National estimates
CIDI modules included in the questionnaire		
Anxiety disorders		
Panic disorder	✔	✔
Agoraphobia	✔	✔
Generalised anxiety disorder		✔
Obsessive compulsive disorder		✔
Post-traumatic stress disorder		✔
Affective disorders		
Major depressive disorder	✔	✔
Dysthymia		✔
Substance use disorders		
Alcohol harmful use		✔
Alcohol dependence	✔	✔
Harmful drug use		✔
Drug dependence	✔	✔
Perceived needs for care		✔
Services used for a mental health problem	✔	✔
Quantifying design error	Laboratory access to data with sampling unit information	Confidentialised unit record file with replicate weights

complaints [43, 56]. As such, GPs constitute a key figure, with unique potential to identify and manage mental health problems existing in about a third of their patients [58, 66]. Considerable effort has been made in the United Kingdom [63], Australia [31], and Canada [21] to increase the efficacy and efficiency of mental health care in primary care settings. Given this large contribution of primary health care to the mental health care system, exploration of the epidemiology of mental health care use should include mapping patterns of care defined by the role of primary care.

Two or more psychiatric disorders can commonly occur in the same individual [25]. Anxiety and affective disorders occurring together are common [75]. Among individuals being treated for a substance dependence disorder, co-morbidity with another mental disorder occurs in 30–90% of cases [27, 28, 45]. In Edmonton, 52.9% of survey participants had more than one psychiatric disorder [18]. In Montreal, respondents with co-morbid disorders were 11 times as likely to have used services in the past year [43]. In the Australian NSMHWB, it was found that 8.2% of adults suffered from more than one mental disorder, and those with co-morbidities were significantly more likely to report mental health consultations than people with a single mental disorder [5, 50].

Summary

The literature shows that there is a need for more cross-national studies that examine the prevalence of mental disorders and utilisation of mental health services, and specifically identify which levels of the mental health care system are being utilised the most and for which co-morbidity patterns.

Aims

To investigate prevalence of mental disorders diagnosed among residents of Australia and Canada, and to examine the utilisation of mental health services in these two countries.

Methods

■ Design

This study involved secondary data analyses of two national surveys: the Canadian CCHS1.2 [29] and the Australian NSMHWB [5, 68]. The key information for the two national surveys, as described below, is presented in Table 1.

The CCHS 1.2 covered representative samples of the Canadian general population at a provincial level. The Australian NSMHWB was designed to yield national estimators of prevalence with acceptable precision down to levels of approximately 1% of the population. Both population-based surveys were cross-sectional, and collected information from countrywide general populations about common mental disorders, factors affecting mental health, and the extent and patterns of mental health care service use. They were also both conducted by national statistics offices. Both surveys used forms of the CIDI [70, 72], a diagnostic tool frequently used for large epidemiological studies of mental health, as exemplified in the ESEMeD project [2]. The two versions of the CIDI have differences but also commonalities for diagnostic criteria assessed and information collected on service utilisation so work with data from

the two survey instruments presents opportunities for comparisons at common levels for service utilisation and prevalence of mental disorders. While the Australian NSMHWB survey collected data for participants 18 years and older, the Canadian CCHS 1.2 survey participants were over 15 years of age. Thus for the purpose of comparability, this study restricted data from the CCHS 1.2 survey to participants 18 years of age and older.

The CIDI versions employed in both surveys produced diagnoses following a Computer-Assisted Personal Interview (CAPI) [12, 29]. The instrument used in the NSMHWB was an adaptation of the 12-month version of the CIDI 2.1, which on one CAPI platform is also referred to as the CIDI–Auto, as developed by the WHO collaborating centre in Sydney [8]. This centre also programmed the entire NSMHWB field interview. The instrument used in the CCHS 1.2 was programmed by Statistics Canada (StatsCan) around selected diagnostic modules of the pencil and paper version of the lifetime instrument, WMH-CIDI [34, 38]. Despite the WMH-CIDI instrument's ability to create lifetime and 12-month prevalence profiles of mental disorders in individuals, the mental health disorders studied in the CCHS 1.2 survey were selected according to the criteria that their anticipated prevalence rate for 12 months would be at least 1% [29], which was a similar design constraint to the Australian survey.

The WMH-CIDI has a number of modifications from the CIDI 2.1 intended to improve problems with underreporting in the CIDI 2.1 [73] consequent on effects such as reliance on semantic rather than episodic recall and on the participants learning to reduce interview length by denying symptoms asked about in the screening sections of the diagnostic modules. All screening sections are grouped in the early part of the WMH-CIDI rather than being at the start of modules in the CIDI 2.1. The WMH-CIDI is a substantially longer interview than the CIDI 2.1-12-Month, and following field trials, interview length constraints led to removal of several diagnostic modules in Canada.

Service utilisation data was collected with survey-specific instruments. Instrumentation was sufficiently similar to allow derivation of comparable classes of broad service use patterns although neither survey allowed for attribution of service delivery to any specific disorder.

Further details on methods of the two surveys can be found elsewhere [5, 29, 68].

■ Analysis

Statistical analyses of the two surveys were conducted somewhat differently. Following the Australian NSMHWB, a series of Confidentialised Unit Record Files (CURFs) was released, the final one in 2000 [11]. This CURF included refined replicate weights that enabled researchers to work on the data and calculate accurate estimates of design error without information on sampling units which were not included on confidentiality grounds. Public release of the Canadian dataset was accompanied with tables of coefficients of variation. For more accurate estimation, copies of the data including sampling unit information were made available at a number of Statistics Canada Regional Data Centres where investigators could work and use bootstrapping methods on the survey data. For the purposes of the comparisons in this paper, however, each of these methods could generate population and subgroup prevalence estimates, with associated standard errors and 95% confidence intervals. For Australia these were calculated using supplied replicate weights using STATA version 9 and for Canada they were calculated by StatsCan using the SAS software package [59].

Past-year-presence of a mental disorder and substance dependence was studied not only according to single diagnostic categories but also co-morbidity, using five co-morbidity categories: (1) major depressive disorder (MDD) only; (2) Anxiety disorders only; (3) Alcohol and/or Drug Dependence only, summarized as substance dependence only; (4) MDD and any anxiety disorder; (5) Substance dependence with any other mental disorder. These co-morbidity classifications were presented because (i) they respected the criteria set by StatsCan on the maximum value of the coefficient of variation as well as the minimum subgroup size for a given cell that can be reported; and (ii) typically in line with the design, the Australian NSMHWB had poor relative standard errors for prevalence rates below 1% and exploratory analyses showed that none of these co-morbidity classifications presented a population estimate substantially below 1%.

Mental health service utilisation in this study was defined as using any outpatient and community clinic service for mental health reasons in the 12 months prior to the interview. Past-year service use for mental health care was studied according to three health provider categories: (1) General Practitioner (GP) only, (2) GP and other health professional (prompts given here included: psychiatrist, psychologist, other physician specialist, nurse, and social worker, so some of the delivery may have been from the social and welfare sector as well as the health sector), and (3) any health professional (as above) but not including a GP.

Population and subgroup prevalence rates and standard errors were estimated and the Australian findings were standardised directly to the Canadian national population 2002. Standardisation in all analyses used the smallest age and sex subpopulation disaggregation that yielded acceptable cell sizes from the NSMHWB data. This varied with the detail of the tables, and the strata used are given as notes to each table. Cross-national comparisons were carried out by estimating event rate differences for Canadian and standardised Australian data with their 95% CI and P-values. The calculation of event rate differences relies on the difference having the property of pooled variance of the two independent samples [20].

One measure of overall severity of mental health problems, the Kessler Psychological Distress Scale (K10) [13, 30, 35] was common to both surveys and so here allows some cross-national comparisons of severity of mental disorders. The K10 has been cross-validated against diagnosis in several countries, including Canada [13].

For diagnostic categories, comparative analyses could only be performed for those categories assessed in both surveys, these being MDD (single episode or recurrent- mild, moderate or severe), panic disorder and agoraphobia (each singly or in combination), alcohol dependence, and drug dependence which included dependence on opioids, cannabis, sedatives, and amphetamines. All analyses used the DSM-IV as the chosen diagnostic classification and reported 12-month retrospective prevalence only.

Results

■ Prevalence rates

Australian and Canadian 12-month prevalence rates of mental disorders were compared in general and common categories of mental disorder with relevant results presented in Table 2. Anxiety disorders were significantly more common by a margin of 1.9% in Canada (4.6%) than in Australia (2.7%). Estimated rates for MDD, alcohol dependence and drug dependence were greater in Australia than in Canada but these findings did not reach conventional statistical significance, with P-values in the range of 0.1–0.2. Much of the excess of anxiety disorders found in Canada is attributable to disorders without co-morbidity from other major groups, with a significant positive difference of 1.7% for the category of people with anxiety disorders only. Apart from this group, estimates for all other co-morbidity classifications were higher in Australia than Canada, though the differences were not statistically significant.

Table 2 Comparisons of psychiatric disorders prevalence rates for Canada and Australia (Adult 18+ years, 12 month prevalence rates)

	Canadian		Australian standardized[a]		Diff. (%)	95% CIs		Significance
	%	SE	%	SE		Low	Up	P-value
Diagnosed mental disorder or addiction	10.2	0.2	11.5	1.9	−1.3	−5.04	2.44	0.25
Disorder specific								
Major depressive disorder	4.8	0.2	6.2	1.1	−1.4	−3.59	0.79	0.11
Anxiety disorders	4.6	0.2	2.7	0.7	1.9**	0.47	3.33	0.00***
Alcohol dependence	2.5	0.1	3.8	1.4	−1.3	−4.05	1.45	0.18
Drug dependence	0.7	0.1	1.7	0.8	−1.0	−2.58	0.58	0.11
Mutually exclusive categories								
No mental disorder or addiction	89.8	0.2	88.4	1.9	1.4	−2.34	5.14	0.23
Major depressive disorder only	3.1	0.1	4.2	1.0	−1.1	−3.07	0.87	0.14
Anxiety disorders only	2.9	0.1	1.2	0.5	1.7**	0.70	2.70	0.00***
Substance dependence only	2.3	0.1	3.7	1.7	−1.4	−4.74	1.94	0.21
MDD and anxiety only	1.2	0.1	0.9	0.4	0.3	−0.51	1.11	0.23
Substance dependence with any mental disorder	0.7	0.1	1.3	0.6	−0.6	−1.79	0.59	0.17

**P < 0.05 Confidence Interval on difference calculated from pooled variance of independent samples; ***P < 0.05 P-values calculated on Z-scores where Confidence Interval intersects 0
[a]Rate you would expect if the Australian rates for each gender and 5-year age group were applied to the 2002 Canadian Population

■ Severity of disorders

Relative severity of disorders is not the primary focus of this paper and details of these analyses will be reported elsewhere but the issue was explored because of its possible bearing on service utilisation. Score rates on the severity bands of the K10 were calculated for Australia and Canada for the diagnostic and co-morbidity categories set out in Table 2. Some key results from this follow concentrating on co-morbidity. Across all the co-morbidity categories the estimation was of a higher percentage of Australians with 'low distress' (score 0–5), with all of these comparisons being significant at P < 0.05 except for the final category of co-morbidities in Table 2. For example for people with MDD only, 29.3% of Australian participants had low psychological distress compared to the Canadian 18.0% while for anxiety disorders only the rates were Australia 32.4% and Canada 21.0%. The results of the K10 measure suggest that Australia has a greater proportion of people with disorders who have low psychological distress, and so overall, lower symptomatic severity.

■ Mental health service utilisation rates

Table 3 presents a comparison between Canada and Australia of service utilisation rates for major categorisations of reported contacts with providers (GP only, GP & Other Health Professional, and Any Other Health Professional but GP) among adults with a mental disorder or addiction diagnosed in the last 12 months. The table suggests that perhaps more people with mental disorders utilise mental health services in Australia (48.7%) than in Canada (35.4%) but this finding falls short of conventional significance at P = 0.07. Across all categories the central estimates are of greater utilisation in Australia but statistical significance criteria are not met.

■ Use of care in the context of different psychiatric morbidities

This study also examined the proportionate relationship of Canadians and Australians with specific mental health disorder patterns to the mental health services utilised. Service utilisation rates for a 12-month period are presented in Table 4 for individuals

Table 3 Service utilisation for mental health care among those with mental disorders (12 month prevalence rates for Canada and Australia)

	Canadian		Australian standardized[a]		Diff. (%)	95% CIs		Significance
	%	SE	%	SE		Low	Up	P-value
No MH consultations	64.6	1.2	51.3	8.8	13.3	−4.11	30.71	0.07
GP Only	12.4	0.8	19.8	7.3	−7.4	−21.79	6.99	0.16
GP & other health professional	14.6	0.8	19.7	6.4	−5.1	−17.74	7.54	0.21
Any other health professional but GP	8.4	0.6	9.0	4.0	−0.6	−8.53	7.32	0.44

[a]Rate you would expect if the Australian rates for each gender and 5-year age group were applied to the 2002 Canadian Population

Table 4 Comparison of service utilization for anxiety, depression, & substance dependence in Canada and Australia

	Canadian		Australian standardized		Diff. (%)	95% CIs		Significance
	%	SE	%	SE		Lower CI	Upper CI	P-value
Anxiety only								
No MH consultations	73.7	1.9	51.2	13.5	22.5	−4.22	49.22	0.05
GP only	11.8	1.5	12.8	9.6	−1.0	−20.04	18.04	0.45
GP & other health professional	8.5	1.1	22.7	13.0	−14.2	−39.77	11.37	0.14
Any other health professional but GP	6.1	1.0	13.3	10.9	−7.2	−28.65	14.25	0.25
Major depressive disorder only								
No MH consultations	52.3	2.0	45.2	8.1	7.1	−9.25	23.45	0.20
GP only	17.0	1.5	23.4	6.5	−6.4	−19.47	6.67	0.17
GP & other health professional	20.0	1.9	21.1	5.9	−1.1	−13.25	11.05	0.43
Any other health professional but GP	10.6	1.1	10.3	4.9	0.3	−9.54	10.14	0.48
Substance dependence only								
No MH consultations	88.5	1.3	78.2	16.3	10.3	−21.75	42.35	0.26
GP only	3.0	0.6	11.6	15.3	−8.6	−38.61	21.41	0.29
GP & other health professional	3.4	0.8	6.1	5.2	−2.7	−13.01	7.61	0.31
Any other health professional but GP	5.1	1.0	4.0	3.2	1.1	−5.47	7.67	0.37
Major depressive disorder & anxiety								
No MH consultations	33.7	3.9	13.7	10.9	20.0	−2.69	42.69	0.04**
GP only	16.1	2.5	31.0	23.0	−14.9	−60.25	30.45	0.26
GP & other health professional	35.8	3.5	46.1	21.7	−10.3	−53.38	32.78	0.32
Any other health professional but GP	14.4	2.5	9.0	10.2	5.4	−15.18	25.98	0.31
Substance dependence & any other disorder								
No MH consultations	52.1	3.9	22.4	11.4	29.7	6.08*	53.32*	0.01**
GP only	18.3	3.2	26.6	17.7	−8.3	−43.55	26.95	0.32
GP & other health professional	19.4	2.8	37.0	16.9	−17.6	−51.18	15.98	0.15
Any other health professional but GP	10.2	2.3	13.9	6.5	−3.7	−17.21	9.81	0.29

Australian rates are standardised to Canadian population 2002 and are those expected if the Australian rates for each gender and the following age groups (18–34, 35–49, & 50+) were applied to the 2002 Canadian Population

MH mental health, *GP* general practitioner

*P < 0.05 Confidence Interval on difference calculated from pooled variance of independent samples

**P < 0.05 P-values calculated on Z-scores where Confidence Interval intersects 0

with a diagnosis of anxiety disorders, MDD, substance dependence, and two categories of co-morbid disorders. The table provides 15 comparisons of positive reports of service utilisation as defined by co-morbidity categories and major groupings of health care service providers (five co-morbidity categories x three service provided groupings). In 12 of these 15 comparisons the proportion of those from Canada with a mental disorder receiving particular services was less than the proportion of Australians. Statistical significance at P < 0.05 is met for the findings of overall greater service utilisation among both of the co-morbidity categories and marginal at P = 0.05 for anxiety disorders only.

Discussion

■ Twelve month prevalence rates of mental disorders

To facilitate comparison in this study, DSM-IV categories were utilised for all analyses. The prevalence rates generated by the DSM-IV classification, however, tend to be lower than in the ICD-10, which has been more commonly used in reporting outcomes from the Australian survey [4]. For example, the Australian NSMHWB one-year prevalence for all ICD-10 anxiety disorders was typically reported as 9.7% [5, 46]. When the same data was analysed so as to be comparable with the CCHS 1.2, this fell dramatically to 2.8%, as it included both fewer disorders and differences between ICD-10 and the DSM-IV. After attention to these aspects of comparability the combined 12-month prevalence rates for all mental disorders that were examined in this study differ slightly between the two countries with Canada having a lower overall rate of 10.2% compared to the Australian rate of 11.5%. The analysis suggests that Canadians have higher rates of anxiety disorders and, more tentatively, perhaps lower rates of MDD and substance misuse.

■ Possible causes for apparent differences

Bias

Non response rates were comparable for the two surveys (CCHS1.2 23%, NSMHWB 22%) so although prevalence may be higher among non responders [37], this is not necessarily a source of systematic error in the comparisons. Age and sex standardisation renders demographic differences an unlikely source

of error. While the different questionnaires were carefully compared and all efforts made to attain consistency in the ways the data sets would be analysed, it was not possible to control for bias arising from interviewer training techniques or for the differences in design of the two versions of the CIDI. We might comment though that the redesign between the CIDI 2.1 and the WMH-CIDI was intended in part to reduce the capacity of participants to learn to manipulate and skip rules to shorten the interview. If they had been successful, then we should expect that the WMH-CIDI might yield higher prevalence figures for the disorders that were placed later in the CIDI 2.1 interview where the opportunity for learning how to manipulate the interview was greater. Anxiety disorders were assessed before affective disorders in the CIDI 2.1 as used in the NSMHWB so the directionality of comparisons is not what would be expected if this were the sole source of the differences found.

Actual differences between the populations studied

The differences detected may reflect secular trends in prevalence rates. Data for the Australian study was collected in 1997; the Canadian study was conducted in 2002. We might speculate that the political and societal context of life in North America in 2002, including for instance a changed security situation, might have included stressors that could promote anxiety disorders in those with vulnerability to these problems that were not present in Australia in 1997. Alcohol consumption in Australia is higher than in Canada (2004 data: Australia 9.2 l per capita; Canada 8.3 l per capita [74]). The findings in Table 2 would be compatible with the tentative speculation that some of the apparent excess of MDD in Australia arises because people with chronic anxiety disorders are regularly employing alcohol in a maladaptive coping strategy that induces MDD.

■ Service use amongst those with diagnosed disorders

The majority of people in both Canada and Australia diagnosed as having had a mental disorder in the past 12 months did not receive mental health interventions. According to the CCHS 1.2, 64.6% of Canadians who had been diagnosed as having a mental disorder in the 12 months prior to the survey being conducted had not received a mental health consultation. The equivalent figure for Australia derived from the NSMHWB was 53.8%. These figures support the assertion by the Lancet Global Mental Health Group [42] regarding the utilisation of services for mental health care.

Although in both countries most people with mental health problems did not receive care, the estimates suggest that more Australians with mental disorders received mental health services than did Canadians. This applies particularly to those with co-morbidities and with anxiety disorders, though the findings are compatible with the possibility that this is true across other categories too. One possible explanation of this would be that both countries have comparable proportionality of service response but that disorders are overall more severe in Australia. However this is not supported by the analyses of the K10 data which would point towards lower severity in Australia.

For Australian mental health workers and policy makers, it would be reassuring if higher rates of service utilisation found amongst Australians with mental disorders resulted from the extensive efforts that have been made within Australia to prevent, treat and educate the public about mental health.

■ Differences in service use by different categories of mental health disorders

It was found that health care service use varies by diagnostic category in both Canada and Australia. This has often been the finding when mental health service use has been examined [7, 17, 46, 47]. We also found that those with co-morbidity were more likely to receive some form of mental health care, replicating the finding of others [6].

In Australia and Canada service use within the diagnostic co-morbidity categories examined in this study was most frequent for people with MDD with any anxiety disorder(s), declining in order through the categories of: substance dependence and any other disorder, MDD only, anxiety disorder(s) only, then substance dependence only. In both countries those with substance dependence disorder were the least likely to have received mental health services. Only 11.5% of Canadians and 21.7% of Australians who had substance dependence disorders had received such services. In both countries, individuals that had both MDD and anxiety (66.3% of Canadians and 86.1% of Australians) were the most likely to have received mental health services.

Variations in service use by disorder categories have been examined in a number of large mental health epidemiological studies [1, 3, 7, 17, 33, 69]. In all of the identified studies where some category of substance dependence disorder (i.e. alcohol, substance, or a combination of these) has been examined (with only one exception [33]), individuals with these disorders are the least likely to have received mental health services. In these studies it was also usually found that individuals with co-morbidity were the most likely to have received services. Furthermore, a higher proportion of those with affective disorders had received services than had those with anxiety disorders. There seems to be a great deal of similarity in the variation in service use by disorder categories across a number of countries.

■ Limitations of the study

Some possible sources of bias have been discussed above and the comparisons are not fully conclusive. We note that the service activity data collection was not standardized, though our close examination concluded that both surveys collected service utilization data for the last year with reasonably comparable items used. Although reasonably comparable at face estimation service use instrumentation was not standardized and the method does not permit certain identification of the target disorder for services delivered. Service use itself could be a confounder for the K10 analyses given the K10 has a shorter timeframe than the 12-month prevalence as derived from the CIDI. Inferences are possible from the Australian survey regarding adequacy of care received based on assessment of levels of met and unmet perceived need [46, 49, 50], but such instrumentation was not included in the CCHS 1.2 so comparison was not possible across these dimensions.

Conclusion

The analyses presented show significant differences in prevalence of anxiety disorders. Consistently, Australia presents a more favourable picture for access to mental health care than does Canada, though still most people with mental health problems do not receive professional help with them. Based on the fact that Australia has been implementing national policy more vigorously than Canada, the results could be seen to reflect favourably on these efforts.

References

1. Alegria M, Kessler RC, Bijl R, Lin E, Heeringa SG, et al (2000) Comparing data on mental health service use between countries. In: Andrews G, Henderson S (eds) Unmet need in psychiatry. Cambridge University Press, Cambridge, pp 97–118
2. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al (2004a) Prevalence of mental disorders in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. Acta Psychiatr Scand 109(Suppl. 420):21–27
3. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al (2004b) Use of mental health services in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. Acta Psychiatr Scand 109:47–54
4. Andrews G, Carter GL (2001) What people say about their general practitioners' treatment of anxiety and depression. Med J Aust 175(Suppl):S48–S51, [see comment] [erratum appears in Med J Aust 2001 Nov 19;175(10):560]
5. Andrews G, Hall W, Teeson M, Henderson S (1999) The mental health of Australians, mental health branch. Commonwealth Department of Health and Aged Care, Canberra
6. Andrews G, Henderson S, Hall W (2001a) Prevalence, comorbidity, disability and service utilisation. Overview of the Australian national mental health survey. Br J Psychiatry 178:145–153
7. Andrews G, Issakidis C, Carter G (2001b) Shortfall in mental health service utilisation. Br J Psychiatry 179:417–425
8. Andrews G, Peters L (1998) The psychometric properties of the composite international diagnostic interview. Soc Psychiatry Psychiatr Epidemiol 33:80–88
9. Ash D, Benson A, Dunbar L, Fielding J, Fossey E, Grey J, et al (2007a) Mental health services in Australia. In: Meadows G, Singh B, Grigg M (eds) Mental health in Australia: collaborative community practice. Oxford, New York, pp 63–98
10. Ash D, Brown P, Burvill P, Davies J, Hughson B, Meadows G, et al (2007b) Mental health services in the Australian states and territories. In: Meadows G, Singh B, Grigg M (eds) Mental health in Australia: collaborative community practice. Oxford, New York, pp 99–131
11. Australian Bureau of Statistics (2000) The national survey of mental health and wellbeing confidential unit record file, users guide. Australian Bureau of Statistics, Canberra
12. Australian Bureau of Statistics (2003) National health survey: mental health, Australia, 2001. Australian Bureau of Statistics, Canberra
13. Australian Bureau of Statistics (2006) Information paper: use of the Kessler psychological distress scale in ABS health surveys, Australia, 2001, 4817.0.55.001. Canberra. Retrieved April 16, 2008 from: http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/B9ADE45ED60E0A1CCA256D2D0000A288?OpenDocument
14. Australian Health Ministers (1992a) National mental health plan. mental health branch. Commonwealth Department of Health and Family Services, Canberra
15. Australian Health Ministers (1992b) National mental health policy. mental health branch. Commonwealth Department of Health and Family Services, Canberra
16. Bijl RV, DeGraaf R, Hiripi E, Kessler RC, Kohn R, Offord DR, et al (2003) The prevalence of treated and untreated mental disorders in five countries. Health Aff 22:122–133
17. Bijl RV, Ravelli A (2000) Psychiatric morbidity, service use, and need for care in the general population: results of The Netherlands mental health survey and incidence study. Am J Public Health 90:602–607
18. Bland RC, Newman SC, Orn H (1997) Help-seeking for psychiatric disorders. Can J Psychiatry 42:935–942
19. Bromet EJ, Gluzman SF, Paniotto VI, Webb CPM, Tintle NL, Zakhozha V, et al (2005) Epidemiology of psychiatric and alcohol disorders in Ukraine. Soc Psychiatry Psychiatr Epidemiol 40:681–690
20. Carlin JB, Doyle LW (2001) Comparison of means and proportions using confidence intervals. J Paediatr Child Health 37:583–586
21. Craven MA, Bland R (2002) Shared mental health care: a bibliography and overview. Can J Psychiatry 47:iS–viiiS, 1S–103S
22. De Girolamo G, Bassi M (2003) Community surveys of mental disorders: recent achievements and works in progress. Curr Opin Psychiatry 16:403–411
23. De Girolamo G, Polidori G, Morosini P, Scarpino V, Reda V, Serra G, et al (2006) Prevalence of common mental disorders in Italy. Soc Psychiatry Psychiatr Epidemiol 41:853–861
24. Demyttenaere K, et al (2004) Prevalence, severity, and unmet need for treatment of mental disorders in the world health organization world mental health surveys. JAMA 291(21):2581–2590
25. First MB (2005) Mutually exclusive versus co-occurring diagnostic categories: the challenge of diagnostic comorbidity. Psychopathology 38:206–210
26. Goldberg DP, Huxley P (1980) Mental iilness in the community: the pathway to psychiatric care. Tavistock, London

27. Gossop M, Marsden J, Stewart D, Lehmann P, Edwards C, Wilson A, et al (1998) Substance use, health and social problems of service users at 54 drug treatment agencies. Intake data from the national treatment outcome research study. Br J Psychiatry 173:166–171

28. Grant BF, Stinson FS, Dawson DA, Chou SP, Dufour MC, Compton W, et al (2004) Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the national epidemiologic survey on alcohol and related conditions. Arch Gen Psychiatry 61:807–816

29. Gravel R, Beland Y (2005) The Canadian community health survey: mental health and well-being. Can J Psychiatry 50:573–579

30. Harvard School of Medicine. Department of Health Care Policy (2005). World mental health survey initiative. Retrieved December 18, 2007 from: http://www.hcp.med.harvard.edu/wmh/

31. Henderson S (2002) The national survey of mental health and well-being in Australia: impact on policy. Can J Psychiatry 47:819–824

32. Hermann R, Mattke S, OECD mental health care panel (2004) Selecting indicators for the quality of mental health care at the health care systems level in OECD countries OECD health technical papers. Organisation for Economic Co-operation and Development, Paris

33. Katz SJ, Kessler RC, Frank RG, Leaf P, Lin E, Edlund M (1997b) The use of outpatient mental health services in the United States and Ontario: the impact of mental morbidity and perceived need for care. Am J Public Health 87:1136–1143

34. Kessler RC, Abelson J, Demler O, Escobar JI, Gibbon M, Guyer ME, et al (2004) Clinical calibration of DSM-IV diagnoses in the world mental health (WMH) version of the world health organization (WHO) composite international diagnostic interview (WMHCIDI). Int J Methods Psychiatr Res 13:122–139

35. Kessler RC, Andrews G, Colpe LJ, et al (2002) Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol Med 32:959–976

36. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE (2005) Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. Arch Gen Psychiatry 62:617–627

37. Kessler RC, Little RJ, Groves RM (1995) Advances in strategies for minimizing and adjusting for survey nonresponse. Epidemiol Rev 17:192–204

38. Kessler RC, Ustun TB (2004) The world mental health (WMH) survey initiative version of the world health organization (WHO) composite international diagnostic interview (CIDI). Int J Methods Psychiatr Res 13:93–121

39. Kirby J, Keon W (2006) Out of the shadows at last. Highlights and recommendations. Ottawa: Final Report of the Standing Senate Committee on Social Affairs, Science and Technology

40. Kirkbride JB, Fearon P, Morgan C, Dazzan P, Morgan K, Murray RM, et al (2007) Neighbourhood variation in the incidence of psychotic disorders in Southeast London. Soc Psychiatry Psychiatr Epidemiol 42:438–445

41. Kringlen E, Torgersen S, Cramer V (2006) Mental illness in a rural area. Soc Psychiatry Psychiatr Epidemiol 41:713–719

42. Lancet Global Mental Health Group (2007) Scale up services for mental disorders: a call for action. Lancet 370(9594):1241–1252

43. Lefebvre J, Lesage A, Cyr M, Toupin J, Fournier L (1998) Factors related to utilisation of services for mental health reasons in Montreal, Canada. Soc Psychiatry Psychiatr Epidemiol 33:291–298

44. Lehtinen V, Sohlman B, Nummelin T, Salomaa M, Ayuso-Mateos JL, Dowrick C (2005) The estimated incidence of depressive disorder and its determinants in the Finnish ODIN sample. Soc Psychiatry Psychiatr Epidemiol 40:778–784

45. Margolese HC, Malchy L, Negrete JC, Tempier R, Gill K (2004) Drug and alcohol use among patients with schizophrenia and related psychoses: levels and consequences. Schizophr Res 67:157–166

46. Meadows G, Burgess P, Bobevski I, Fossey E, Harvey C, Liaw ST (2002) Perceived need for mental health care: influences of diagnosis, demography and disability. Psychol Med 32:299–309

47. Meadows G, Fossey E, Harvey CA, Burgess P (2000a) The assessment of perceived need. In: Andrews G, Henderson S (eds) Unmet need in psychiatry, problems, resources, responses. Cambridge University Press, Cambridge, pp 390–398

48. Meadows G, Harvey C, Fossey E (2000b) Perceived need for mental health care, findings from the Australian national survey of mental health and well being. Psychol Med 30:645–656

49. Meadows G, Harvey C, Fossey E, Burgess P (2000c) Assessing perceived need for mental health care in a community survey: development of the perceived need for care questionnaire (PNCQ). Soc Psychiatry Psychiatr Epidemiol 35:427–435

50. Meadows G, Liaw T, Burgess P, Bobevski I, Fossey E (2001) Australian general practice and the meeting of needs for mental health care. Soc Psychiatry Psychiatr Epidemiol 36:595–603

51. Medina-Mora ME, Borges G, Lara C, Benjet C, Blanco J, Fleiz C, et al (2005) Prevalence, service use, and demographic correlates of 12-month DSM-IV psychiatric disorders in Mexico: results from the Mexican national comorbidity survey. Psychol Med 35:1773–1783

52. Miranda J, Siddique J, Belin TR, Kohn-Wood LP (2005) Depression in prevalence in disadvantaged young black women. Soc Psychiatry Psychiatr Epidemiol 40:253–258

53. National Mental Health Strategy Evaluation Steering Committee (1997) Evaluation of the national mental health strategy. Commonwealth Department of Health and Family Services, Canberra

54. Oakley-Browne M, Wells J, Scott K (2006) Te Rau Hinengaro: the New Zealand mental health survey. Ministry of Health, Wellington

55. Ovuga E, Boardman J, Wasserman D (2005) The prevalence of depression in two districts of Uganda. Soc Psychiatry Psychiatr Epidemiol 40:439–445

56. Parslow RA, Jorm AF (2000) Who uses mental health services in Australia? An analysis of data from the national survey of mental health and wellbeing. Aust NZ J Psychiatry 34:997–1008

57. Pirkola SP, Isometsä E, Suvisaari J, Aro H, Joukamaa M, Poikolainen K, et al (2005) DSM-IV mood-, anxiety- and alcohol use disorders and their comorbidity in the Finnish general population. Soc Psychiatry Psychiatr Epidemiol 40:1–10

58. Rosenberg E, Lussier MT, Beaudoin C, Kirmayer LJ, Dufort GG (2002) Determinants of the diagnosis of psychological problems by primary care physicians in patients with normal GHQ-28 scores. Gen Hosp Psychiatry 24:322–327

59. SAS Institute Inc (2004) Base SAS 9.1 procedures guide. SAS Institute Inc, Cary

60. Simon GE, Goldberg DP, Von Korff M, Üstün (2002) Understanding cross-national differences in depression prevalence. Psychol Med 32:585–594

61. Singleton N, Bumpstead R, O'brien M (2001) Psychiatric morbidity among adults living in private households, 2000. Stationery Office, London

62. Statistics Canada (2004) Canadian community health survey, cycle 2.1 (2003): health services access in Canada

63. Thomas RV, Corney RH (1993) Working with community mental health professionals: a survey among general practitioners. Br J Gen Pract 43:417–421

64. Vasiliadis HM, Lesage A, Adair C, Wang PS, Kessler RC (2007) Do Canada and the United States differ in prevalence of depression and utilisation of services? Psychiatr Serv 58:63–71

65. Vicente B, Kohn R, Rioseco P, Saldivia S, Navarrette G, Veloso P, et al (2006) Regional differences in psychiatric disorders in Chile. Soc Psychiatry Psychiatr Epidemiol 41:935–942

66. Wang J, Langille DB, Patten SB (2003) Mental health services received by depressed persons who visited general practitioners and family doctors. Psychiatr Serv 54:878–883

67. Wang PS, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, Borges G, Bromet EJ, et al (2007) Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. Lancet 370(9590):841–850

68. Whiteford H (2000) Introduction: the Australian mental health survey. Aust NZ J Psychiatry 34:193–196

69. Wittchen H-U (2000) Met and unmet need for interventions in community cases with anxiety disorder. In: Andrews G, Henderson S (eds) Unmet need in psychiatry. Cambridge University Press, Cambridge, pp 256–276

70. Wittchen H, Essau C (1993) An overview of the composite international diagnostic interview. Int J Methods Psychiatr Res 3:220–233

71. World Bank (2006) Data and statistics. country classification. Retrieved March 4, 2008 from: http://www.worldbank.org/data/countrydata/countrydata.html

72. World Health Organisation (1994) Composite international diagnostic interview (CIDI) researchers manual. World Health Organisation, Geneva

73. World Health Organisation (1997) Composite international diagnostic interview: CIDI-Auto 2.1; administrator's guide and reference, fast books

74. World Health Organization (2004) Global status report on alcohol 2004. World Health Organization, Department of Mental Health and Substance Abuse, Geneva

75. Zimmerman M, Mcdermut W, Mattia JI (2000) Frequency of anxiety disorders in psychiatric outpatients with major depressive disorder. Am J Psychiatry 157:1337–1340